^{197}Pt β^- decay (19.8915 h)

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Huang Xiaolong, Zhou Chunmei	NDS 104, 283 (2005)	1-Jan-2002

Parent: ^{197}Pt: E=0.0; J^π=1/2$^-$; $T_{1/2}$=19.8915 h *19*; Q(β^-)=718.7 *6*; %β^- decay=100.0
Sources produced by ^{196}Pt(n,γ) (1937Mc04,1941Sh08,1952Ha16,1964Pr06,1965Ha15,1966Ga07,1971Pr03).

^{197}Au Levels

For analyzed levels of β^- decay by using interacting boson-fermion model, see 1988Na03.

E(level)†	J^π‡	$T_{1/2}$‡	Comments
0.0	3/2$^+$	stable	
77.35 *4*	1/2$^+$	1.91 ns *1*	Level polarization determined in Mossbauer study of oriented ^{197}Pt β^- decay (1970Eh01); deduced matrix element mixing for first-forbidden β^- decay.
268.78 *4*	3/2$^+$	15.4 ps *13*	Branching: Iγ(269γ)/Iγ(191γ)=0.049 *10* (1974HeYW), 0.063 *6* (1965He04), 0.07 *1* (1965Ha15). See also ^{197}Hg ε decay and Coul. ex. (77γ)(191γ)-coin: 1952Sc27, 1956Po05, 1965He04.

† From decay scheme and Eγ's by using least-squares fit to data.
‡ From Adopted Levels.

β^- radiations

Measured Eβ, Iβ (1971Pr03); others: 1941Sh08, 1952Sc27, 1956Po05, and 1964Gr02.
For the calculated log *ft* by using interacting boson-fermion model, see 1988Na03.

E(decay)†	E(level)	Iβ^-‡#	Log *ft*	Comments
(449.9 *6*)	268.78	8.2 *8*	6.79 *5*	av Eβ=132.02 *20* β(191γ)(θ) correlation is isotropic (1971Pr03).
642.3 *6*	77.35	81.2 *30*	6.310 *17*	av Eβ=197.56 *22* (670β)(77γ)-coin (1956Po05).
719.0 *6*	0.0	10.6 *28*	7.36 *12*	av Eβ=225.21 *22* Iβ^-: I(719β)/Iβ summed (1971Pr03).

† 440β unobserved (Iβ<0.002%).
‡ From γ intensity imbalance.
# Absolute intensity per 100 decays.

γ(^{197}Au)

Iγ normalization: From ΣI(γ+ce)(g.s.)+Iβ(g.s.)=100, where Iβ(to g.s.)=10.6 *28* (1971Pr03).

x-ray intensities

Radiations	E, Kev	a	Intensities	b		
Au L x-ray	9.710		21 *4*	a		
Au Kα_2 x ray	66.9895 *8*		0.98 *10*	a	1.0	c
Au Kα_1 x ray	68.8037 *8*		1.68 *17*	a	1.7	c
Au Kβ x ray	78.00		0.73 *8*	a	0.76	c

a, Calculated Values

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b, Values per 100 parent decays
c, Measured values (1990Pi08)
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E_γ †	I_γ ‡@	E_i(level)	J^π_i	E_f	J^π_f	Mult.#	δ	α &	Comments
77.35 *5*	465 *45*	77.35	1/2+	0.0	3/2+	M1+E2	−0.35 *1*	4.24 *7*	α(L)= 3.21 *6*; α(M)= 0.780 *14*; α(N+..)= 0.244 *5* I_γ: from I(K x ray+77γ)=550 *50* minus I(K x ray)=85 (1965He04); others: 330 *3* (1965Ha15), 488 *43* (1974HeYW). δ: from L-subshell ratios (1959Va13,1972Pa40) via ^{197}Hg decay. L1:L2:L3=100:42 *7*:35 *8* (1967Ba63), 100:51 *1*:37 *1* (1971Kr06).
191.437 *10*	100	268.78	3/2+	77.35	1/2+	M1+E2	0.14 *1*	1.174 *2*	α(K)= 0.9606 *22*; α(L)=0.16354 *7*; α(M)=0.03791 *3*; α(N+..)=0.01195 δ: from (L1+L2)/L3=66 *5* (1970Sh10, ^{197}Hg decay). L1:L2:L3=100:9.3 *5*:1.4 *3* (1966Ga07). K:L1:L2=608 *8*:100:7.8 *1* (1971Kr06), K/L=5.9 *2* (1966Ga07). α(K)exp=0.93 *20* (1965He04). Others: 1964Po05, 1965Ha15, 1971Kr06, 1973Ba66. I(ce) L-subshell spectrum (1973Ba66) conflicts with others.
268.78 *5*	6.3 *6*	268.78	3/2+	0.0	3/2+	E2(+M1)	>3.4	0.147 *3*	α(K)=0.0821, α(L)=0.0469, α(M)=0.01186, α(N+..)=0.00370, α=0.1446 if mult=E2. α(K)=0.1061, α(L)=0.0483, α(M)=0.0121, α(N+..)=0.0038, α=0.15 if mult=E2(+M1), δ=3.4. I_γ: from 1965He04. Others: 4.9 *10* (1974HeYW), 7 *1* (1965Ha15). δ: from (L1+L2)/L3=2.8 *3* (1970Sh10, ^{197}Hg decay).

† From 1974HeYW, semi.
‡ Relative intensity normalized to Iγ(191γ)=100.
# From L-subshell ratios.
@ For absolute intensity per 100 decays, multiply by 0.037 *4*.
& Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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